Joint MPH Program
University of Gondar and Addis Continental Institute of Public Health

ASSESSMENT OF CAUSES OF MISSED OPPORTUNITY FOR ROUTINE IMMUNIZATION IN ADDIS ABABA

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A THESIS SUBMITTED TO THE SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF GONDAR, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER'S IN PUBLIC HEALTH

June 2009

Acknowledgment

Firstly I would like to thank God for his Loving kindness and his help in every step

I would like to thank the University of Gondar and Addis Continental Institute of public health for their initiation to create the opportunity of this learning.

I would like to acknowledge my Advisors Professor Yemane Berhane and Dr. Abera Kume for their unreserved support and constructive comments for the entire preparation of this thesis.

I would like to forward my respect and appreciation for those who agree to participate in this study and for all who participate in the data collection.

I would like to thank WHO for its funding support.

I would like to thank Addis Ababa Regional Heath Bureau, The 10 Sub city Health offices and the respective health centers who facilitate the study.

I would like to thank my sisters and brothers who were supporting me during the whole course of my study.

Finally to my dear husband Fisseha Abegaz and beloved children Yom and Zelealm who were giving their time to me during the whole study period.

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Acronyms

1- ANC---Ante Natal Care

2- AOR ----Adjusted Odds Ratio

3- BCG---Bacille-Calmette-Guerin(tubrculosis vaccine)

4- cMYP----comprehensive Multi-Year Plan

5- COR---Crude Odds Ratio

6- DPT----Diphtheria-Pertusis-Tetanus

7- EFY----Ethiopian Fiscal Year

8- EOS---Enahanced Outreach Strategy

9- EPI-----Expanded Programme on Immunization

10- FMOH----Federal Ministry Of Health

11- GAVI------Global Alliance for Vaccine and Immunization

12- Hep.B-----Hepatits B

13- Hib-------Hemophilus influenza type b

14- HSDP III--- Health Sector Development Programme

15- IMNCI---- Integrated Mother Neonate and Child Intervention

16- IMR---Infant Mortality Rate

17- MDG----Millennium Development Goal

18- NGO------Non Governmental Organization

19- MOH------Ministry Of Health

20- NIDs----National immunization days

21- NIP--------National Immunization Programme

22- OPV----- Oral Polio Vaccine

23- RED------Reaching Every District

24- SOS--------Sustained Outreach Service

25- TT--------Tetanus Toxoid

26- UNICEF-------- United Nations Children's Fund

27- VPD--------Vaccine Preventable Diseases

28- WHO------World Health Organization

ABSTRACT

BACK GROUND: - Inadequate level of immunization against child hood diseases remains a significant public health problem in resource poor areas of the globe. Missed opportunities for immunization were some of the main influencing factors identified in different studies done at different regions and time.

OBJECTIVE: - try to asses the magnitude of missed opportunities for immunization and try to assess the causes of missed opportunity for immunization in Addis Ababa.

METHODS: - cross sectional study conducted in 10 public health center which are currently functional in AddisAbaba.Exit client interview was done for 845 accompanying women of infants 0-1 year of age. Additionally in depth interview for 20 health care providers working in those health centers performed from March, 2009-June, 2009.

RRESULT:- proportion of missed opportunity for immunization was 7.5% for children and 30.5% for TT immunization of eligible women having statistically significant association with maternal education, place of delivery and those never married women were more likely missed the opportunity for children and TT immunization.

CONCLUSION AND RECOMMENDATION:-the proportion of missed opportunity for both child and women seems low presumably because of integrated child health service in the health facilities. FMOH, city health authorities and other responsible bodies need to expand access to EPI services in order to increase routine immunization coverage by involving private clinics and providing out reach services in the selected high population concentration and hard to reach areas. Activities to increase maternal motivation, awareness creation and social mobilization should be done. It is recommended to do community based study in order to see the status in the community.

1. INTRODUCTION

EPI was initiated in 1974 by WHO with the goal to make vaccination available to children through the world. Ten years later in 1984, WHO established a standard vaccination schedule for the original EPI vaccines: BCG, DPT, Oral polio and Measles. Increased knowledge of immunologic factors of diseases led to new vaccines development and included in the original EPI's list of recommended vaccines: Hep.B, Yellow fever in countries endemic for the disease, and Hib. In 1999 GAVI was created with sole purpose of improving child health in the poorest areas by extending the reaching of EPI (1).

In Ethiopia EPI was launched in 1980 with the aim of reducing mortality and morbidity of children and mothers from VPDs and increasing the immunization coverage of less than two years of age by 10% annually and reach 100% coverage by 1990 against six EPI target diseases (Tuberculosis, poliomyelitis, Diphtheria, pertusis, Tetanus, and Measles) and all pregnant women for the prevention f neonatal tetanus, How ever this target has not been realized even after two decades. In 1986 the coverage target was reviewed to 75%. By 1990 the immunization coverage figure was vary largely between the regions from more than 80% coverage of DPT3 in Tigray to less than 5% in Somali and Afar regions; resulting a national DPT3 coverage 50%. The long term goal of EPI strategy of MOH is to achieve 90% coverage of DPT3 at all level .since 1986 the target groups were changed to less than one year of age children to be in line with the global immunization target (2, 3, 4, 5) .Since Ethiopia is a diverse country, there was the need to develop the new approach or specific strategies to reach each area. The developed strategies were implementation of RED and SOS with the target to increase coverage certain priority

areas by 10% and in others by 5%, giving a total national immunization coverage increase of 6% in a year (2).

The EPI peogramme in Ethiopia is run by the MOH in close cooperation with WHO, UNICEF and other partners, implemented in each region by regional health bureaus, and the programme is funded by partners and government (2, 5).EPI services are being given in most of public health facilities, outreach services for the community residing in range of 5-15 KM from the health facilities, private sectors and NGOs operating health related activities, and it is given free of charge. Since the first quarter of 2007 the pentavalent formulations (DPT-Hep.B-Hib) were introduced in to routine immunization to make the antigens eight (4).Since the last quarter of 2003 at which time RED and SOS have been implemented, improvement of the coverage has been documented .How ever there are also system barriers related to geographical coverage and human resource which constraints the provision of service delivery (5).

In Addis Ababa , according to the annual EPI report in 1999EFY the coverage of under one year was 42% for penta 3 coverage. Where as75% received only first dose of DPT-Hep.B-Hib indicating the presence of dropout (6). By the year 2000 EFY the coverage rate was 46.4% for children and 32% for TT2 plus in pregnancy (7).Generally the EPI services are given almost in all public health facilities, most of private hospitals and NGOs in Addis Ababa. There is an assumption that people are utilizing curative health care more than preventive services. There is also a suspicion of large number of children coming to the health facilities for curative services (sick baby clinic, nutritional rehabilitation and growth monitoring) who are eligible for immunization may be send back to home with out getting immunization, which is called missed opportunity for

immunization. This study was conducted to asses the proportion of missed opportunity for immunization, and to assess the factors associated with missed opportunities for immunization in Addis Ababa. It might show the possible areas of further research and also can be used by planners, policy makers and all concerned bodies to make informed decision.

2. LITERATURE REVIEW

Immunization is the corner stone of public health activities. Until 2000 through determined effort of national government, international agencies, and volunteers 2.5 million children's lives were saved each year. But there were 30 million infants not protected by routine immunization in developing countries. At that time the problems that the world faced were to reached the unreached children and to extend the power of new or improved vaccines in developing countries (8, 9).

Though the introduction of new and expensive vaccines are challenging the cost effectiveness of immunization ,vaccination against six diseases included in the original EPI schedule is one of the most cost effective way to improve child health. How ever many countries have not achieved the expected coverage and even those reaching 80% have been experienced much variation between districts. For example in India in 1992-1993 71%of the richest children were protected from measles where as only 22.8% of the poorest 20%of children received such protection. There fore to increase efficiency and equity policy should drive on an increasing the coverage rate. Review of public literature suggested that the most effective strategies were community health worker and door to door canvassing (10).

By reducing morbidity and mortality there is substantial contribution to achieve the MDGs. In 2006 WHO estimated that immunization saves 2-3 million lives. How ever, 1.4 million children were estimated to have died from VPDs which was the reflection of incomplete coverage with existing vaccines that persists in many parts of the world. In that same year 157 WHO member states of developing countries only 42 states (27%)had

three doses of DPT more than 80% in all districts even though there were new opportunity existed to strengthen immunization coverage in developing countries(10,11).

Globally immunization services have been the center renewed interest with the increased funding to improve services, acceleration of introduction of new vaccines, and the development of health system approach to improve vaccine delivery. The work of GAVI alliance and the new funding streams brought increase attention. In order to take full advantage of newly available resources for routine EPI there should be understanding of the range of proven strategies and approaches to deliver vaccines and to reduce incidence of disease (9). Vaccination in Ethiopia is provided in health facilities all over the country with static, outreach, and mobile health strategy. Before one year of age routine immunization schedule should be completed by all children and women of child bearing age to prevent neonatal tetanus (2). Although the IMR has decreased from97/1000 in 2000 to 77/1000in 2005, still it is among the highest in the world.472,000 under five children were died each year which shows the poor health status of the children, These deaths were mainly due to preventable causes. Access of health services reached 72 %(5).

2.1 ROUTINE EPI COVERAGE

According to the historical coverage rate trends; Europe and Central Asia, Latin America and Caribbean, and the middle east and North Africa are expected to achieve 90% coverage of fully immunized child by 2011, with east Asia and Pacific, south Asia and sub-Saharan Africa lagging behind. Establishing and maintaining high immunization coverage rate in many of the poorest developing countries have proven challenging for those with high population growth rate, limited infra-structure, resources and fluctuating demands for services. Increased and higher immunization coverage rate will require

further efforts particularly when a perception exists at the community level the VPDs are no longer a major public health issues. High coverage brings a decrease in disease control burden. Targeted approaches have high yield especially in those areas with poor control of VPDs. Immunization saves 3 million lives per year however millions of children still do not have access to basic immunization and died from VPDs (12).

Study done in Dhaka in 2005 showed the immunization coverage rate of less than two years of age was 66%. As the study showed the coverage rate for each antigen among children by 12 months of age by card & history was high such as BCG=97%, DPT1 and OPV1=97%, DPT3& OPV3=75%, and measls=67% (13). An other study done in 1995 in central African republic showed that the coverage of DPT3, Measels and all antigens were 53%, 54%, and 34% respectively which was indicating low coverage(14). In Swaziland the immunization coverage rate was 54% as shown in a 2003 study done in Swaziland (15). Recent study done in Mozambique showed that the EPI target diseases are seven (tuberculosis, poliomyelitis, pertusis, diphtera, tetanus, measles and hepatitis B). The reported coverage of EPI vaccines was 80-95%, but these figures include incomplete and incorrect vaccination and also this coverage was not uniform throughout the country, with rural areas presenting the lower coverage (16).

Ethiopia's immunization coverage has not reached the targeted figure and planed objectives (2). According to EDHS 2005 the immunization coverage for specific vaccines was for BCG, DPT3, POLIO3, and MEASLES were 60%, 32%, 45%, and 35% respectively (17). The recent national reports showed that the routine immunization coverage rates are 54% in 1998 EFY, 52.5% in 1999 EFY, and 66.6% in 2000 EFYfor fully immunized(for DPT3/Penta3 75.6%,72.6% and 81% respectively) which still

indicates low coverage (18,19,20). An other study in Gondar showed that 47.4% were fully immunized, where as 30% were not immunized at all and only 38% of mothers were vaccinated by TT more than once (21). To validate the administratively reported coverage rate and to assess reasons for immunization failure the FMOH started to conduct EPI coverage cluster survey every 5 years since 2001. The 2006 survey showed that the DPT3 coverage of children by the age of one year (by card and by history) was 60% ranging from 97% in Addis Ababa to 20.8% in Somali regions .Based on card and history indicator Addis Ababa, Tigray, SNNPR, Harari and, DireDawa regions have met the WHO African region child immunization target of DPT3 is greater or equal to 80%. The national weighted TT2 plus coverage by card and card plus history were 41%and 75.6% respectively. Regional coverage by card ranging from 58.1%in Tigray to 8.2% in Afar regions the coverage rate by card and by history is ranging from92% in Addis Ababa to 40% in Somali regions the card and history coverage rate was greater or equal to 80% in 6 regions (Tigray, Ben. Gumuz, SNNPR, Harari, Addis Ababa and DireDawa, regions) (3, 22).

Access to immunization services were also assessed based on DPT coverage rate and utilization of immunization services were assessed based on DPT1 to DPT3 dropout rate. Despite 84.3% of the population had access nationally, both the overall and most of regional utilization of immunization services were low. Only the Tigray and Addis Ababa met the acceptable threshold target of less than 10% DPT1to DPT3 dropout rate. In four regions dropout rate were moderate (10.1%-20 %) and the rest regions had greater than 20.1%. DPT1 to MEASLES was also high except Addis Ababa (6.7%). Oromia, Ben. Gumuz and Gambella regions had record of greater than 50%dropout rate of DPT1 to

Measles. Urban dwellers had DPT3 coverage 77.6% and rural counterparts had 63.2%.It was also shown that the presence of strong association between maternal (caretaker) educational level and immunization coverage that is illiterate had 47.6% where as mothers or care takers having high school education had 86.9% immunization coverage (3).According to the health and health related indicators the coverage trend in Addis Ababa is 45.4% in 1998EFY, 42 % in 1999 EFY and 46 4% in 2000 EFY (18,19,20).

2.2 INFLUENCING FACTORS FOR ROUTINE IMMUNIZATION COVERAGE

As we see in those old and scarce studies which are stated above, the immunization coverage was not satisfactory. The influencing factors for this low coverage were such as high dropout rate, giving of invalid vaccines, factors associated with accessibility to the vaccination site, no schooling of the mothers, children born at home and missed opportunity. Out of these factors missed opportunity was the main problem associated with low coverage or vaccination failure (13, 14, 15). According to EPI review conducted in 2001 the constraints of the programme are lack of supervision, high drop out rate, inadequate number of trained health worker, and inadequate supplies like cold chain equipment (2).

Some of studies done in Ethiopia at different regions in the former times showed the different causes of this low coverage for example one study which was conducted in 3 selected administrative regions showed that the main factor was non attendance in immunization which resulted from low maternal education and sending back of mothers with out their children being vaccinated (23). The reasons for not immunized were lack of knowledge, social problems and others like child sickness and health institutions related factors (21). In AdamiTulu one study showed that the major problems were high

dropout rate due to far distance to immunization site, time to immunization, and lack of awareness for the need to return for second and third doses; as well as high missed opportunities in both child hood immunization and maternal immunization (24). Study conducted in Tigray also showed that the major influencing factors were maternal education and area of residence, which is urban residents, had high coverage as compared to rural residents (25). According to the cluster survey the reasons for immunization failure were include lack of information (50.3%), lack of motivation (5.4%) and different obstacles (44.3%) (3). It was also stated that there were other causes like contraindication and maternal attitude (26). Though there is a scarcity of recent studies in Ethiopia the accessible studies showed that like other countries missed opportunities for immunization were the major factor for vaccination failure (23, 24, 25).

2.3 MISSED OPPORTUNITY FOR ROUTINE IMMUNIZATION

Globally the magnitude of missed opportunities for immunization was median of 32% which were the major influencing factors to increase immunization coverage among children and women of child bearing age .The main cause of these missed opportunity were failure to administer simultaneously all vaccines for which a child was eligible, false contraindication, health worker's practices, not opening the multi dose vaccine vial for small number of persons to avoid vaccine wastage, and logistical problems (27).

In Dhaka missed opportunities were frequent in three areas (28). In central Africa the missed opportunities for immunization was 70% as study showed in 1995 (14). In Swaziland 54% of children less than 2 years of age were missed for immunization which constitutes 26% of all children less than2 years old leaving the health facilities studied. Almost 100% of child bearing ages were missed for vaccination constituting 88% of

women of child bearing age leaving the study facilities. The distribution of missed opportunities varied considerably between regions and health facility types. Missed opportunities more likely occurred in facilities providing integrated services (15).

Study done in India urban teaching hospital Madras medical college showed missed opportunities for routine immunization had been35.5% for those attending sick baby clinic and 23.1% for those attending new born follow up clinic (29). In Mozambique 28.2% of children had not completed the vaccination programme by the end of 2 years age, 25.7% had experienced missed opportunity for immunization, and 14.9% were incorrectly vaccinated (16).

Study done in Sudan in 1989 showed that out of 236 infants brought to the health facility for reason other than immunization 58% were in need of at least one antigen and 33% needed three or more antigens. More over, 29% of those children had never been vaccinated before. There were a number of obstacles to taking advantage of these opportunities to vaccinate children and mothers in the health centers. These include mothers not bringing their children's vaccination card, the mothers' fear of vaccinating sick children the health workers' knowledge, attitude and practices; the physical arrangement of health facilities(30). In Addis Ababa Missed opportunity for immunization had a significant effect on EPI coverage with a magnitude of about 41% in 1989 for which the study has been conducted (26).

2.4 POLICY IMPLICATION

Based on the above stated studies the major influencing factor for immunization failure was missed opportunities for immunization, the strategies forwarded were different in different regions: For example in Dhaka it was recommended that there should be

increased efforts to monitor, strengthen quality of EPI activities and programmatic strategy should be undertaken to reduce the existing missed opportunities in both children and TT immunization (28). In Swaziland, all regions must need to set vaccination coverage targets and develop plans to increase coverage, which should include strategies to ensure that on health workers routinely screen clients for eligibility and vaccinate required (15). In Sudan, although the potential of missed opportunity was likely great, there are some serious obstacles to be overcome and decisions to be made before that potential would be realized. For example, how should vaccination to be given to children and mothers who did not bring their immunization cards with them is recorded? This was not an easy decision, as it could have serious effects on the accuracy of EPI reporting system and coverage survey. Further more, mothers and health workers should be convinced that it is not dangerous to vaccinate mildly sick children; it was also recommended that training of health professionals to the practical points of immunization. Research should be focused on intervention studies that examine ways of decreasing the number of missed opportunity by use of easily implemented strategies (30).

Generally the national immunization programmes in developing countries are responsible for improving access to the traditional EPI antigens and introducing new vaccines. In 2002 EPI introduced the reaching each district strategy(RED), which focused on achieving an 80% coverage rate of DPT3in 80% of districts and using immunization contacts to deliver high priority child health interventions, additionally the NIPs are concerned with quality and safety of immunization through the adoption of safe injection technologies, proper cold chain and vaccine stock maintenance(31).

In Ethiopia it had been recommended that to achieve the goal of EPI universal coverage there must be strategy to alleviate these problems such as strategy for utilizing all opportunities for immunization, strengthening of health education, strengthening of primary health care and extension of the eligibility criteria. Attendance at the MOH clinic had a positive effect on completing the immunization, integration of MCH services including outreach activities, community mobilization and efforts to raise awareness of mothers in both urban and rural areas (21, 23, 25, 26, 32).

Training of all categories of health workers, availability of written guide lines, strengthening of supportive supervision, cold chain maintaining, sterilizing of equipments, administering vaccines and field working skills should be improved through in-service training and standardized staff incentives with efficient management, strengthening of monitoring & evaluation of EPI at all level, safety immunization injection, social mobilization activities which should be continuous & strong to ensure community involvement in EPI activities and enhanced intersectoral collaboration and community participation to extend opportunities to vaccinate eligible children and mothers. There must be strong efforts on NGOs and private sectors involvement in immunization services. Donor agencies should be in allocating funds for immunization and there should be incorporation of external assistance for strategic planning to create national capacity for self reliance (33). Knowing of those different factors responsible to the low coverage rate led to the introduction and implementation of new approaches such as RED, EOS, and intensified training & supportive supervision promoted by GIVS. These strategies were implemented in Ethiopia in late 2003 which brought an improvement of immunization coverage (52% in 2003 and 69% in 2005) (3).

Based on the HSDP III with the goal of reducing morbidity and mortality due to VPDs by providing good quality of immunization services FMOH prepared a comprehensive multi year plan (2006-2010) which provides a frame work plan activities to achieve the major objectives of immunization programme such as to reduce maternal and child mortality and morbidity by immunizing every child and women of child bearing age against VPDs and contribute to the achievement of MDGs (4, 5).

The primary objective of the cMYP is to achieve 80% DPT3/OPV3 and MEASLES coverage in 90% of the districts by 2010 which encompasses all components of immunization services.(service delivery, vaccine supply, quality and logistics, disease surveillance and accelerated disease control, advocacy, social mobilization, communication and programme management) (5).

Due to the change of immunization efforts from developmental change to disease control and eradication, the complexity of programme, and the development of new vaccines the national EPI policy guideline was revised in 2007 by the FMOH with strategies for increased vaccination coverage , reduce missed opportunity, defaulter tracing, increasing the quality of immunization services, improve public awareness and community participation to sustain high immunization coverage, disease control/eradication/elimination, and capacity building by ensuring pre service and in-service training in EPI and assignment of humane resource for EPI (4) .

3. OBJECTIVES:-

1. To assess the proportion of missed opportunities for routine immunization in Addis Ababa.
2. To assess the reasons of missed opportunities for routine immunization in Addis Ababa.

4. METHODOLOGY

4.1 STUDY AREA:-

The study was conducted in Addis Ababa .The estimated area of Addis Ababa is about 540sq.m divided in to 10 sub cities and 199 kebeles. According to the 2007 census the total population of the city is about 2,738,248, the under five children are 195,932, and under one year children are about 36,443.

EPI in Addis Ababa was started in 1980.The service is provided in the city almost in all public health facilities (hospitals, health centers, clinics, health posts and as outreach programme in some of the sub cities), private hospitals and some NGOs working in line with health (Personal communication).

Study was conducted in public health center which are functional during the study period. In the city there are 24 public health centers which are currently functional. The health centers are divided for each sub city and each sub city has at least one and the highest 4 health center. Immunization coverage trend for Addis Ababa since 1992 EFY until 2000 EFY is shown on fig.1. Initially it showed some increment but since 1998 EFY the coverage rate declining and it sustained with in the range of 40- 50 % for the last 3 years.

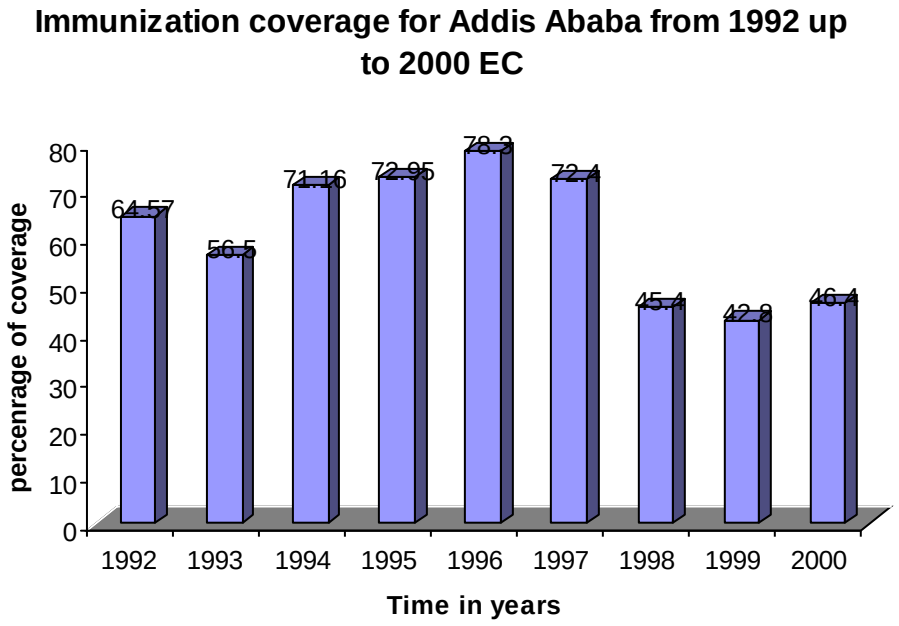

Fig.1 Immunization coverage (for DPT3 and Pentavalent 3) for Addis Ababa from 1992-2000 EC. Addis Ababa,2009 (34EC)

4.2 DESIGN

Health facility based both quantitative Cross sectional study and qualitative study was conducted in the selected public health centers in Addis Ababa which were currently functional with a plan to assess the proportion of missed opportunity for immunization and to identify the causes of missed opportunity for immunization.

4.3 QUANTITATIVE STUDY

4.3.1 SOURCE OF POPULATION: - is all under one Year old children and women of child bearing age in Addis Ababa.

4.3.2 STUDY POPULATION

The study populations were children under one year of age and accompanying women visiting the selected health facility during the study period for routine service such as curative services, growth monitoring, and nutritional rehabilitation.

Inclusion criteria:-under one year of age infants coming to the health facilities for medical services other than immunization service and accompanying women to whom they were eligible for routine immunization.

Exclusion criteria:-infant who was severely ill and need referral to higher level during the time of data collection, if there was emergency situation for the infant who came to the health facility at the time of study, and women who were not willing to participate in the study.

4.3.3 SAMPLE SIZE FOR QUANTITATIVE

$$n=\frac{DE \times (Z1-\alpha/2)^2 \times P(1-P)}{(D^2)}$$

n=sample size

DE=design effect=2

Confidence interval (α =0.05, 95% Z1-α/2) =1.96

D = degree of precision =5%

P = proportion of missed opportunity for routine immunization= 50%

Since there is scarcity of recent study on missed opportunities for routine immunization to get recent figure I took 50% proportion.

$$=\frac{2 \times 1.96 \times 1.96 \times .50 \times .50}{0.05 \times 0.05}$$

$$= 2 \times \frac{3.8416 \times .25}{0.0025}$$

$$=2 \times \frac{0.9604}{0.0025}$$

= 768.32

To compensate the possible missed clients or non response add the 10% of N =77

n =768.32 +77 =845 ,**The total sample size will be 845**

4.3.4 SAMPLING TECHNIQUE

By using multistage sampling technique from the Addis Ababa Regional Health Bureau the sub city health section were selected. From each sub city one health center was selected randomly. In the selected health center the clients were selected consecutively until the required sample for the particular health center was full. The total sample (845) was divided and allocated to each selected health center according to principle of probability proportional sampling to the client load that is health centers with high client load was having greater probability(Fig.2).

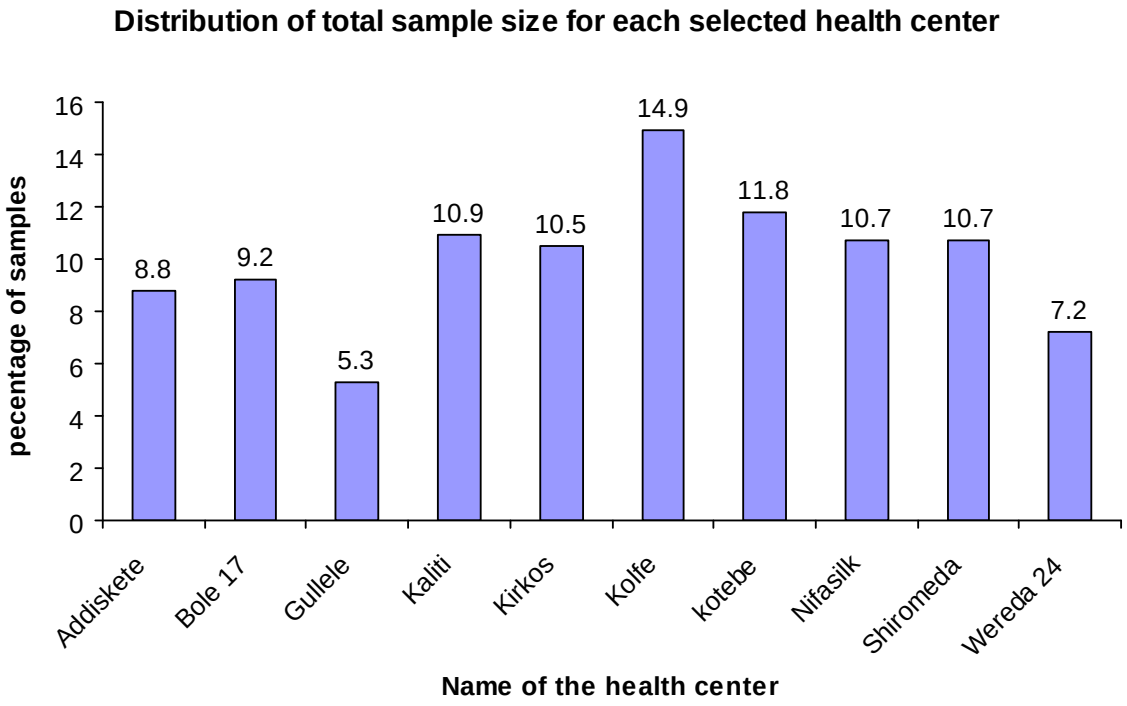

Fig. 2 Distribution of total sample size to each selected health centers in Addis Ababa,2009

4.3.5 SAMPLING FRAME WORK:-By using multistage stratified sampling technique

Addis Ababa

Regional Health bureau

↓

All sub cities' health section

↓ From each sub city 1 health center selected randomly

Selected 10 health centers

↓ Stratified by service

IMNCI in the selected health Center

↓ Stratified by types of clinic

Children attending IMNCI for routine service like curative, Nutritional Rehabilitation and growth monitoring services And accompanying women

↓ Stratified by age

Less than 1 year old children attending the clinic in the selected Health centers and accompanying women

Fig.3 Sampling frame work

4.3.6 DATA COLLECTION

After reviewing the different relevant literature questions that can address the objectives of the study were gathered and adopted from the previous studies (3, 17, 35). the questions were developed and organized in such away that to assure measurement of the

following variables, such as socio demographic variables, immunization status of the child and the accompanying women, magnitude of missed opportunities for immunization and its influencing factors, knowledge of the accompanying women about the name of vaccine and the target disease of EPI, and to get general information about the condition of selected health facilities in EPI services.

The questionnaire were prepared in English then translated to Amharic and then back translated to English by external personnel in order to check its consistency in the content of the instrument.

The criteria for recruitment of data collectors were 12th grade completed or above, both sexes, free of any addiction, those who have similar experience and fluent Amharic language (spoken and written).

Training on data collection was given by the investigator for one day prior to pre testing and one day after pre test. The training was mainly about brief objectives of the study, the content of the data collecting tool in detail and how to use in the field. It was given in the form of lecturing, discussion, demonstration and role play. One up to two data collectors were assigned in each health center based on the daily number of client flow in the selected health facilities. Pre testing of the questionnaires was done by the data collectors in randomly selected four public health centers which have similar activities with the health centers included in the study and those pre tested health centers were not included in the study. The purpose of pre testing was to assess the clarity, understandability and completeness of the questions in the questionnaire. According to the results of the pre testing the questions were modified.

Data were collected by using pre tested standard questionnaires while the client was exiting from the selected clinics in the facility after getting routine services such as curative services, nutritional rehabilitation and growth monitoring and interview was done at one corner near under five clinic. Principal investigator was doing supervision by touring to each health center during the data collection time.

4.3.7 DATA ANALYSIS

The out come variable was missed opportunities for routine immunization and the explanatory variables were socio demographic characteristics which include child's sex & age, place of birth, relation to care takers, number of other siblings, types of clinic that the child was attended, and maternal (care takers) age, educational status, occupation, religion, marital status and house hold monthly income. The others were associated factors related to knowledge of the mother or care takes about the name of vaccines and target diseases of EPI. Data obtained from each study participants were edited and each variable was coded accordingly. During the analysis data were entered by using Epinfo 3.5.1 version and later converted to SPSS version 15. Data cleaned and analyzed by using SPSS computer soft ware package. Simple frequency method was used for data cleaning. Proportions and frequencies will be used to describe the study population, Bivariate analysis was done to see vaccination status and missed opportunity for immunization, to calculate the differences in proportion, and to assess the association between the dependent and independent variables. The degree of association was tested using odds ratio. Binary Logistic regression analysis was performed in order to investigate relative importance of variables in relation to the dependant factors and control the potential confounding variables.

4.3.8 DATA QUALITY ISSUES

Data quality was assured by translation, retranslation & pre testing of the questionnaires. Proper training was given for interviewers by preparing training manuals, close supervision of data collecting procedures and daily checking of the data for its completeness and accuracy by the investigator was done.

4.4 QUALITATIVE STUDY

4.4.1 STUDY POPULATION

The study population for qualitative were health care providers working in the public health centers.

4.4.2 SAMPLE SIZE

The qualitative study was not decided at the beginning of the study. It was decided after having information on the research question via the quantitative study. Form each health center 2 key informants were included in the study with a total of 20 health care providers having work experience in EPI one year and above.

4.4.3 SAMPLING TECHNIQUE

The key informants were selected by their responsibility in the health centers and experience on routine EPI. One EPI coordinator and one medical director of the health center were included in the study. To get more information as the medical directors suggested in two health centers the key informants were EPI and MCH coordinators.

4.4.4 DATA COLLECTION

Data for the qualitative study were collected by in-depth interview using semi structure topic guides. A total of 20 health professionals 2 from each health centers currently working in the selected health centers were interviewed. The selected key informants

were EPI coordinators, medical directors and MCH coordinators in the selected health center. All interviews were done in the health centers which were included in the study. The questions were concerning routine EPI service, routine EPI service organization, quality of routine EPI service, routine EPI coverage and missed opportunities for routine EPI service.

4.4.5 DATA ANALYSIS

After transcription and translation of the data were completed, data cleaning was done by listening and re-reading of the interviews repeatedly. The cleaned data were coded and categorized in different themes.

4.5 Operational definitions

Fully immunized child: - A child who had completed the recommended EPI immunization schedule of BCG, DPT-HepB-Hib, & OPV (3 DOSES), and MEASLES.

Partially immunized up to date:- child who had received all the immunization for which he/ she was eligible by age criteria.

Partially immunized not up to date:-child had not completed the doses of vaccine for his/her age as per schedule.

Unimmunized:-a child who had not yet received any vaccines for the age, though eligible.

Contraindication in general, for all vaccination(4) **:-**

1. severe febrile illness which needs hospital admission.
2. previous untoward reaction to particular vaccine such as convulsion, anaphylaxis, shock and encephalopathy soon after or with in three days of DPT vaccine

injection, should get vaccine containing the whole cell pertusis , if available only DT should given.

3. infants who developed anaphylaxis following measles immunization.
4. convulsion following hepatitis B immunization.
5. infants who had anaphylactic reactions such as generalized urticaria, difficulty of breathing ,selling of the mouth & the throat , hypotension or shock following ingestion of egg should not take yellow fever vaccination.

Missed opportunities for immunization:-missing the benefits of getting immunization by the partially or unimmunized child, during a visit to health facility checkup/illness , when there is no absolute contraindication for that particular immunization.

Defaulter:- if the child has started the initial antigen but has not completed the full course of immunization.

4.6 ETHICAL CONSIDERATION:-

After the ethical clearance to conduct the study obtained from the UNIVERSITY of GONDAR and ADDIS CONTINENTAL INSTITUTE OF PUBLIC HEALTH, permission to conduct the study in Addis Ababa public health centers from Addis Ababa regional health bureau was obtained after discussion about the purpose of the study.

The aim of the study was explained to the mothers /care takers accompanying the child who was included in the study and their verbal informed consents was obtained. The informant was informed that the recorded information will be kept confidentially and no name was recorded on the questionnaires. The respondents were assured that each of them has a right to refuse to participate in the study or to withdraw from the study freely according to their convenience at any time with out any repercussion.

5. RESULTS

The results of both qualitative and qualitative study will be presented together. Quotes from the in-depth interviews are stated in the presentation to explain the conditions by the respondents own word.

5.1CHARACTERISTICS OF THE STUDY AREA

5.1.1 SOCIODEMOGRAPHIC CHARACTERISTICS OF THE STUDY PARTICIPANTS

CHILDREN:-

Of the 845 children whom included in the study 424(50.8%) were male and 410(49.2%) females. About 307(36.4%) were 9 months and above with the mean age of 6.87months with standard deviation of ±3.54 (minimum 0, maximum 12). Most of them **710(85.6)** were borne in the health facility . Of the included children in the study 753(89.1%) were attended in the sick baby clinic. (Table1).

MOTHERS/CARE TAKERS:-

Eight hundred forty five accompanying mother/care takers who brought the child to the health center were interviewed. 801(94.8%) of the respondents were mothers of the children,. Most of the respondents 432(52.9%) were with in the age rang of 25-34yrs. About 343(40.6%) were elementary school. About 767(91.5%) were married. Concerning the religion 642(76.2%) were Christian and 201(23.8%) were Muslim, Of the 843 respondents 463(54.9%)didn't have children other than the one who was shown up at the time of the survey.632(75.0%) of the respondents were housewife.(others include house made, beggars and those who were living by charity from some organizations). Of the 557 respondents who could recall their monthly house hold income 251(45.1 %) were getting less than 500birr., About 817(96.9%) were eligible for TT immunization and

26(3.1%) were not (Table 1).Of the 845 respondents 648(76.7%) were unable to mention the name of the vaccine name and 470(55.6%) were unable to mention the target disease of routine EPI.

Table 1 Socio demographic characteristics of the children and the mother/care taker attended in the public health centers included in the study in Addis Ababa, 2009

1 . Characteristics of the child	Number	Percent
Sex of child (n=834)		
Male	424	50.8
Female	410	49.2
Child age(n=843)		
<3 months	142	16.8
3 to 5 months	170	20.2
6 to 8months	224	26.6
>=9 months	307	36.4
Mean ± SD	6.87 ± 3.54	
Place of birth(n=829)		
health facility	710	85.6
home	119	14.4
Type of clinic(n=838)		
Sick baby clinic	753	89.9
Nutrition/Growth monitoring	85	10.1
2. characteristics of mother/care taker		
Relation of care takers to the child(n=843)		
mother	801	95.0
other	42	5.0
Care taker's age(n=817)		
15-24 yrs	316	38.7
25-34 yrs	432	52.9
35 and above	69	8.4
Education(n=844)		
Illiterate	280	33.2
Elementary(1-8)	343	40.6
secondary+	221	26.2

Marital status(n=838)		
married	767	91.5
never married	42	5.0
divorced/separated/widowed	29	3.5
Religion(n=843)		
Christian	642	76.2
Muslim	201	23.8
Number of other children(n=843)		
None	463	54.9
1 up to 2	313	37.1
more than 2	67	7.9
Occupation of mother /care taker(n=843)		
house wife	632	75.0
self employee	73	8.7
daily laborer	51	6.0
Gov/NGO	47	5.6
Others	40	4.7
Monthly HH income(n=557)		
<=500 birr	251	45.1
501-1000 birr	219	39.3
>1000 birr	87	15.6
Eligible for TT(n=843)		
Eligible	817	96.9
Not eligible	26	3.1

Note The percents are for the rows.

5.1.2 STATUS OF THE SELECTED HEALTH CENTERS ON ROUTINE EPI ACTIVITIES

All health centers included in the study were governmental organizations which were under the management of Addis Ababa regional health bureau. All health centers have EPI service. In all health centers there is no problem of vaccine and cold chain supply which was supported by in-depth interview the vaccines and cold chains are supplied by the sub city and no problem. Previously the cards and other stationary materials were given by regional health bureau but recently the health center subjected to cover it by itself. But it was mentioned that there is some problems on the rooms, As they stated the room of the EPI department is not convenient, it is very narrow and over crowded by different materials even one room is used for the immunization site and also place of cold chain due to this reason in some places they are giving the vaccines in open air.

"As you see here it is very narrow and over crowded by different old materials and the documents are not kept properly. If one comes and wants to get some information, it is difficult to find the documents easily and the room is not convenient to give the vaccine here that is why we give the vaccine in open air in the waiting room"

The other respondent said regarding the rooms " *As you see the cold chain stock for the sub-city is here, all health facilities under this sub-city which are giving immunization service are getting the vaccine from here and the room is narrow & not convenient. When the guests come from different governmental and non governmental institutions always they were giving us a comment on the room though for the future it is planned to renovate it".*

There are trained health professionals on EPI in all health centers who were assigned in the EPI unit at the time of interview. By in-depth interview regarding the staffs it was mentioned that most of the EPI staffs are trained, but the numbers of staffs assigned in the health center are not enough. It ranges from 1 up to 3 regular staffs assigned in the health centers and in some places there are recently graduated nurses who are giving free service in the health centers who were assigned as assistance. All were recommended to have more staffs in EPI because it is giving full time service and no limitation of number of clients.

Of the 10 health centers in 4(40%) health centers the staffs took training 3 months prior to the time of the interview and in the rest 6(60%) health centers it was more than 12 months prior to the time of interview. All the staffs in the selected 10 health centers claimed that they recorded always on the immunization card after each vaccination. There was no standard guideline for contraindication of immunization in all health centers included in the study but they consider some conditions as contraindications like fever of >=37.5 degree celicius, diarrhea and vomiting especially for polio, symptomatic polio, symptomatic measles and symptomatic exposed infants for HIV but in three health center there was no conditions for which they were using as contraindication (Table 2)

Table 2 Conditions which were considered as contraindication for immunization in the public health centers in Addis Ababa, 2009

Contraindications	NO of health Centers NO (%)
No contraindication	3(30%)
Fever >=37.5 degree celicius	6(60%)
Diarrhea and vomiting	4(40%)
Symptomatic polio	1(10%)
Symptomatic measles	2(20%)
Symptomatic exposed infant for HIV	2(20%)

5.3.IMMUNIZATION STATUS OF THE CHILDREN

The immunization status of the children at the time of interview, 11(1.3%) were totally not vaccinated, 52(6.2%) were not up to date vaccinated for their age, 533(63.2%) were up to date vaccinated for their age and 247(29.2%) were fully vaccinated.

The specific reasons for not being able to vaccinate their children identified by 35(4.2%) of the mothers/care takers were lack of information (includes unaware of need for immunization, unaware of the need to return for subsequent doses of vaccines, don't know the advantage of immunization and wrong information about immunization schedule); lack of motivation(includes postponed the appointment date, home delivery, don't want to have vaccination, and forgetting about the immunization & immunization date); and obstacle(includes mother sick, mother was separated from her child, went to rural area, immunization card lost, mother busy, inconvenience of the mother and vaccine was not available) .

5.4ASSESMENT OF MISSED OPPORTUNITY FOR CHILD'S IMMUNIZATION AND ASSOCIATED RISK FACTORS

Of the 843 children proportion of missed opportunities of child's routine immunization was about 7.5% (Table 3).

Table 3 Proportion of missed opportunity for immunization in less than one year of age children in Addis Ababa, 2009

Missed opportunity for immunization(n=843)	NO (%)
yes	63(7.5)
no	780 (92.5)

Only 34(54%) of the mother/care takers of missed children who missed the opportunity could recall the reason for not being immunized (Table 4).

Table 4 Reasons for not being able to vaccinate the child less than one year of age by Missed opportunity for child's immunization in Addis Ababa, 2009

Reasons(n=34)	Missed NO (%)
lack of information	7(87.5%)
lack of motivation	16(100.0%)
obstacle	11(100.0%)

Percentage for the rows

By in depth interview as they said all who come to the health center for one or an other reason were addressed especially children" *If they come to the health facility for any service and if the child is eligible(<2yrs of age), we always ask the mother; was the child vaccinated or not if not he/she will sent to the EPI unit and they will get the necessary vaccine for the age."*

Some said that there may some but it is rare because the current trend is trying to get all the eligible children in the health facility when they show up for any reason. Most of the respondents said that there is no problem of missing if they come to the health center but the problem is with defaulters some people start immunization in one site and they might disappear. For these defaulters there was no firm tracing mechanism one time it was tried to trace them by volunteer service givers and kebele people by picking their name from the register book and give the names to the volunteers .The volunteers tried to do home to home survey but most of the residents have no permanent address since almost all clients were living in rental house so that it was difficult to trace them and failed. In some health centers currently they started to take their telephone address for tracing mechanism *"Now most of the communities have cell phone and we started to take their telephone address if possible cell phone "* .

"It was also mentioned that there may be missing in those who could not come to the health facility but it needs home to home survey study because even in the periphery areas there are some health posts and outreach services and they may use there. But the problem is most of the community in the periphery have not good awareness on immunization so that they may miss the opportunities". One respondent also mentioned that currently there is no missed opportunity in the health facility but there are many in the community for which they saw them during polio NIDs campaign. *"When we went to home to home polio vaccination campaign there were many children who were not vaccinated".*

The comparison of missed opportunity to non missed opportunity by socio economic and socio demographic factors of the children and the accompanying mother /care taker done by cross tabulation showed the presence of statistically significant difference for maternal/care taker education, place of birth, number of siblings, monthly house hold income and maternal/care takers marital status as shown on table 6 with p-value < .05 (Table 5).

Table -5 The association of missed opportunity for child immunization less than one year of age by different socio demographic factors of children and the accompanying women/care taker

1.characteristics of the child	Missed NO(%)	Not-missed NO (%)	Chi-square	df	P-value	Crude OR (95% CI)
Sex of child (n=834)						
Male	28 (6.6)	396 (93.4)				1.00
Female	33 (8.0)	377 (92.0)	.447	1	.504	1.24(0.73,2.09)
Child age(n=843)						
<3 months	9 (6.3)	133 (93.7)				1.00
3 to 5 months	13 (7.6)	157 (92.4)				1.224(0.507,2.952)
6 to 8months	19 (8.5)	205 (91.5)				1.370(0.602,3.118)

>=9 months	22 (7.2)	285 (92.8)	.644	3	.886	1.141(0.511,2.545)
Place of birth (n=829)						
health facility	34 (4.8)	676 (95.2)				1.00
home	29(24.4)	90 (75.6)	55.896	1	.000*****	6.4 (3.73, 11.0)
Type of clinic (n=838)						
Sick baby clinic	58(7.7)	695(92.3)				1.0
Nutrition/Growth monitoring	5(5.9)	80(94.1)	.149	1	.699	1.34(0.52,3.43)
Religion(843)						
Christian	46 (7.2)	596 (92.8)				1.00
Muslim	17 (8.5)	184 (91.5)	.207	1	.543	1.20(0.67,2.14)
Care taker's age (n=817)						
15-24 yrs	23 (7.3)	293 (92.7)				1.00
25-34 yrs	27 (6.3)	405 (93.8)				1.28(.427,3.814)
35 and above	4 (5.8)	65 (94.2)	.391	2	.822	1.08(.367,3.197)
Education(n=84)						
Illiterate	35(12.5)	245 (87.5)				1.00
Elementary(1-8)	21 (6.2)	320 (93.8)				4.367(1.901,10.035)
secondary+	7 (3.2)	214 (96.8)	16.991	2	.000*****	2.006(.838,4.802)
Number of other child(n=843)						
None	25(5.4)	438(94.6)				1.00
1 up to 2	27(8.6)	286(91.4)				1.654(,941,2.907)
more than 2	11(16.4)	56(83.6)	11.233	2	.004*	3.441(1.607,7.372)
Monthly HH income(n=557)						
<=500 birr	25(10.0)	226(90.0)				1.00
501-1000 birr	11(5.0)	208(95.0)				.478(.230,.996)
>1000 birr	3(3.4)	84(96.6)	6.378	2	.041*	.323(.095,1.097)
Occupation(n=843)						
Gov/NGO	2(4.3)	45(95.7)				1.00
self employee	3(4.1)	70(95.9)				.964(.155,5.999)
house wife	48(7.6)	584(92.4)				1.849(.435,7.857)
daily laborer	5(9.8)	46(90.2)				2.446(.451,13.261)
others	5(12.5)	35(87.5)	3.850	4	.427	3.214(.588,17.565)

Marital status of mother/care taker(n=838) Married Never married Divorced/separated/widowed	 53(6.9) 8(19.0) 2(6.9)	 714(93.1) 34(81.0) 27(93.1)	 6.255	 2	 .044*	 1.00 3.17 (1.40,7.19) .99 (.23,4.31)
child & care taker relation (n=841) mother other	 61(7.6) 2(4.8)	 738(92.4) 40(95.2)	 .537	 1	 .464	 1.00 .605(.143,2.563

Note -The percentages were calculated for the rows
*** - p value <0.05**

Variables like maternal/care taker education, place of birth, number of siblings, monthly house hold income and maternal/care takers marital status were entered to multivariate analysis to identify the possible confounders. As shown on table 6 the significant association was found with the place of birth that is those who borne at home were 6 times more likely missed the opportunity than borne in the health facility. Those who had 2 or more number of siblings were more likely missed the opportunity than those who didn't have siblings .There is also significant association with educational status

Table -6 Selected factors associated with Missed opportunity for routine immunization for children less than one year of age in Addis Ababa,2009

characteristics	Missed NO (%)	Not-missed NO (%)	Crude OR (95%CI)	Adjusted OR (95% CI)
Place of birth(n=829)				
Health facility	34(4.8)	676 (95.2)	1.00	1.00
Home	29(24.4)	90 (75.6)	6.4(3.73,11.0)	6.042(2.716,13.442)*
Number of other child(n=843)				
None	25(5.4)	438(94.6)	1.00	1.00
1 up to 2	27(8.6)	286(91.4)	1.654(,941,2.907)	1.102(.468,2.189)
more than 2	11(16.4)	56(83.6)	3.441(1.607,7.372)	3.790(1.430,10.045)*
Education(n=842)				
Illiterate			1.00	1.00
Elementary(1-8)	35(12.5)	245(87.5)	4.37(1.901,10.035)	.580(.267,1.259)
secondary+	21 (6.2)	320(93.8)	2.01 (.838,4.802)	.266(.083,.853)*
Monthly HH income(n=557)	7 (3.2)	214(96.8)		
<=500 birr	25(10.0)	226(90.0)	1.00	1.00
501-1000 birr	11(5.0)	208(95.0)	.478(.230,.996)	.480(.231, 1.001)
>1000 birr	3(3.4)	84(96.6)	.323(.095,1.097)	.327(.096,1.111)
Marital status(n=838)				
married	53 (6.9)	714(93.1)	1.00	1.00
never married	8 (19.0)	34 (81.0)	3.17(1.40,7.19)	3.067(.801,11.736)
divorced/separated	2 (6.9)	27 (93.1)	0.99(0.23,4.31)	1.429(.307,6.655)
widowed				

Note percentage calculated for the row
Adjusted OR is the out put of logistic regression including all variables on the table

5.5 MISSED OPPORTUNITIES FOR TT IMMUNIZATION AND ASSOCIATED FACTOS

TT immunization status of eligible women who accompany the child is that women who took protective dose of TT were 578(68.6%), who took TT not protective dose were 181(21.5%) , whom did not took TT vaccine at all were 84(10%) . Of the 817 eligible women for TT immunization about 249(30.5%) women had missed opportunity.

The reasons for not taking TT immunization were categorized in three major groups such as lack of information(don't know about the use of TT immunization and the need to return for subsequent doses, wrong information about the immunization schedule), lack of motivation(postponed the immunization appointment day, don't use ANC service, interruption after delivery by them selves, the interruption of the ANC follow up, don't want to take the TT vaccination, forgotten the immunization appointment date) and obstacles(went to rural area, far from immunization site, vaccinator absent and vaccine not available, immunization card lost, women were sick, women busy and inconvenience).Of those who missed opportunities 248 were able to recall the reasons for not taking TT vaccine (Table-7).

Table -7 Reasons for not taking TT immunization mentioned by eligible women who missed the opportunities in the health centers In Addis Ababa ,2009

Reasons(n=248)	NO (%)
lack of information	138(55.6)
lack of motivation	90(36.3)
obstacle	20(8.1)

By in depth interview the respondents said that for the mothers, the service is not integrated as such. Most of the mothers will get TT during pregnancy when they went to health center for ANC service. But in the case of the non pregnant ones unless they went to health centers primarily for immunization and family planning they will not get it especially for those who didn't have pregnancy previously. In some places it was stated that there was a trend to vaccinate all eligible women if they come to the health facility

for one or an other reason "*when they came to our health center for medical service, the staffs at OPD were bring the vaccine from the EPI unit and gave the vaccine to them after health education was given"* but it was failed and stopped.

It was also mentioned that the coverage for TT immunization is very low as compared to the children immunization coverage. Currently to increase the TT coverage, TT immunization campaign was started in different high school and some factory by the coordination of UNICEF as they stated. By the campaign only two doses were given and appointed to go to the near by health centers for the subsequent doses but some of the respondents said they have doubt that the client will come and take the vaccine because there is a problem of awareness still. *"when we start the campaign it was difficult to get the girls in the class because most of the school girls believed TT is a kind of contraceptive and some had a fear of being infertile. Even their mothers forbid them by saying don't take the vaccination"*.

The difference between TT missed opportunity and not TT missed opportunity was statistically significant by marital status, occupation, educational status of the women and place of delivery with p- value < 0.05(Table -8).

Table-8 TT missed opportunity of the accompanying eligible women by different socio demographic characteristics in Addis Ababa, 2009

Characteristics of mother /care taker	**Missed NO(%)**	**Not missed NO(%)**	**Chi-square**	**df**	**p-value**	**COR (95% CI)**
Age (n=799)						
15-24 yrs	109(34.5)	207(65.5)				1.00
25-34 yrs	118(27.7)	308(72.3)				0.728(0.531,0.996)
35 and above	17(29.8)	40(70.2)	3.963	2	.138	0.807(0.437,1.490)

Marital status (n=812)						
married	216(29.0)	528(71.0)				1.00
never married	23(56.1)	18(43.9)				3.123(1.652,5.905)
divorced	8(29.6)	19(70.4)	13.457	2	.001*	1.029(0.444,2.387)
Occupation(n=817)						
Gov/NGO	5(11.9)	37(88.1)				1.00
Self employee	21(31.3)	46(68.7)				3.378(1.162,9.820)
House wife	187(30.0)	436(70.0)				3.174(1.228,8.202)
Daily laborer	19(39.6)	29(60.4)				4.848(1.616,14.544)
Others	17(45.9)	20(54.1)	12.980	4	.011*	6.290(2.020,19.586)
Monthly house hold income(n=543)						
<=500 birr	79(32.0)	168(68.0)				1.00
501-1000 birr	51(24.1)	161(75.9)				0.674(0.446,1.018)
>1000 birr	18(21.4)	66(78.6)	5.318	2	.070	0.580(0.323,1.042)
Educational status(n=816)						
Illiterate	105(38.7)	166(61.3)				1.00
Elementary(1-8)	97(29.0)	238(71.0)				0.644(0.459,0.905)
Secondary+	46(21.9)	164(78.1)	16.416	2	.000*	0.443(0.295,0.667)
Number of other children(n=817)						
None	153(34.0)	297(66.0)				1.00
1 up to 2	79(25.8)	227(74.2)				0.676(0.490,0.932)
more than 2	17(27.9)	44(72.1)	5.968	2	,051	0.750(0.415,1.357)
Religion(n=817)						
Christian	190(30.7)	428(69.3)				1.00
Muslim	59(29.6)	140(70.4)	.041	1	.839	0.949(.670,1.346)
Place of delivery(n=803)						
health facility	197(28.6)	491(71.4)				1.00
home	46(40.0)	69(60.0)	5.505	1	.019*	1.662(1.105,2.499)

*- P value < 0.05

As shown on table 11 selected variables were entered in the logistic regression model to investigate the presence of relative association or confounding. In the case of educational status it showed the presence of significant association which showed a protective effect. As compared to governmental /non governmental employee the other occupations showed 3 to 6 times more likely to have missed opportunities. It was also shown being never married has 3 times less likely to be missed than married. Those who deliver at home have 2 times more likely to be missed as compared to delivery in the health facility (Table 9).

Table -9 Association of TT missed opportunity with selected socio demographic factors

Characteristics of mother /care taker	**Missed NO(%)**	**Not missed NO(%)**	**COR (95% CI)**	**AOR(95%CI)**
Marital status (n=812)				
married	216(29.0)	528(71.0)	1.00	1.00
never married	23(56.1)	18(43.9)	3.123(1.652,5.905)	3.182(1.667,6.072)*
divorced	8(29.6)	19(70.4	1.029(0.444,2.387)	.843(.359,1.980)
Occupation(n=817)				
Gov/NGO	5(11.9)	37(88.1)	1.00	1.00
self employee	21(31.3)	46(68.7)	3.378(1.162,9.820)	3.138(1.074,9.169)*
house wife	187(30.0)	436(70.0)	3.174(1.228,8.202)	2.947(1.137,7.638)*
daily laborer	19(39.6)	29(60.4)	4.848(1.616,14.544)	4.441(1.474,13.379)*
others	17(45.9)	20(54.1)	6.290(2.020,19.586)	6.057(1.942,18.891)*
Educational status(n=816)				
Illiterate	105(38.7%)	166(61.3%)	1.00	1.00
Elementary(1-8)	97(29.0%)	238(71.0%)	0.644(0.459,0.905)	.606(.427,.860)*
Secondary+	46(21.9%)	164(78.1%)	0.443(0.295,0.667)	.422(.277,.643)*
Place of delivery(n=803)				1.00

health facility home	197(28.6%) 46(40.0%)	491(71.4%) 69(60.0%)	1.00 1.662(1.105,2.499)	1.601(1.060,2.419)*

*** The presence of significant association**

5.6 SUMMARY OF THE INDEPTH INTERVIEW RESULTS

A total of 20 interviews have been done between May 13, and May 30, 2009 in the selected 10 public health centers in Addis Ababa. The medical directors of the health centers, EPI coordinators, MCH coordinators, and one OPD coordinator were interviewed at different health centers and two key informants were interviewed at each health center by using key informant interview technique.

Out of the 20 respondents 16 are diploma nurses, 3 are Bsc nurses and 1 is General Practitioner. Except one who has only 2 yrs of work experience as a health professional,all the rest have 5 to 22 years of work experience as health professional at different health institutes. The questions were based on the routine EPI service, service quality, service organization, missed opportunity for routine EPI and routine EPI coverage.

Routine EPI service

All respondents said that the routine EPI service is given full day through out the week unless it is holiday or weekends in the health center and there is at least one trained staff on EPI in the department and the service currently is integrated. It was also mentioned that previously the vaccines were six types but since 2 years two vaccines were combined to DPT and it is said to be Penavalent for which it consists of five drugs the rest are the

same like Polio, BCG and Measles making the whole vaccine eight antigens all these drugs are given in different way. There is also TT for women of reproductive age (15-49yrs). Most of the respondents said that generally the service showed improvement especially for children but as one of the respondents stated it is slow and needs big effort to make it universally accessible.

All are using standard schedule of routine immunization for both children and mothers. In all health centers it was mentioned that due to high vaccine wastage rate of BCG and measles the schedule is twice a week .For the question where you get the eligible clients, all of them said that the service is integrated especially in children. In the IMNCI unit one of the questions of the IMNCI register is immunization status of the child and if the child is eligible but not immunized there is a link with the EPI unit and the child will get the respective vaccine.

"*In the pediatric department there is IMNCI register which asks about the immunization status of the child and every staff there should ask. If the child was not vaccinated, there is a link and they will send to us then we will give the respective vaccine*" .And some of them said "*we started to give PICHT service for mothers who brought the child here in the EPI unit*".

For mothers in the case of TT immunization, the service is not integrated as such, as the respondents' said. Most of the mothers will get TT during pregnancy when they went to health center for ANC service. But in the case of the non pregnant ones unless they went to health centers primarily for immunization and family planning they will not get it especially for those who didn't have pregnancy previously. In some places it is stated that there was a trend to vaccinate all eligible women if they come to the health facility for

one or an other reason" *when they came to our health center for medical service, the staffs at OPD were bring the vaccine from the EPI unit and gave the vaccine to them after health education was given"* but it was failed and stopped.

The reasons of this failure stated by the respondents were most of the people who came for the medical service are busy so that they want to get the service as soon as possible and back to home for their daily activities for their subsistence and they don't want to stay here for long time. The other is for the time being when they offered they accept and took the vaccine but they will not come for the subsequent doses and it was not possible to trace them because at the time of vaccination they were not registered; only the immunization card and appointment was given to the client and planned to register when the client come for the second TT. Only tally was done to know how much was vaccinated on that day so that it was difficult to get the address.

The other thing which was stated during the interview was about awareness of the clients on EPI. Most of them mentioned that the awareness of the clients on immunization here in Addis Ababa seems better especially for children by saying *"All mothers who are residing here in Addis Ababa know about immunization use. The mothers are getting health education during pregnancy at ANC unit and if the delivery is in the health facility the child will get the first vaccine in the facility. If it is at home, they bring or send the baby immediately after delivery for immunization."* On the contrary to this there are two respondents who said the awareness of the clients on EPI is still not changed and no attention is given for immunization. They also said health education on EPI is not given properly. One of the respondents said *"what I realized is concerned prevention on EPI health education is not given where ever I go I don't feel comfort on this aspect."* It was

also mentioned by one respondent that the medical service here in the country is backward. Since the health policy of the country is prevention, vaccination should get attention. *"Because vaccination is back bone for human life in all aspect"*.

The other thing which was mentioned during the interview was that the presence of some factors which influence the immunization service that are the culture and the socio economic condition of the communities. Most of the clients who are using the health centers for one or the other reason are from low socioeconomic status and their subsistence is relied on small scale trade and they give priority for their daily activity so that they may not come to health center for immunization. *"Since they are from low socioeconomic class they are running to under go their small scale trading and if the immunization date is on market day, they will give priority for their daily activity"*.

Routine EPI service organization

As it was mentioned most of the health centers were giving only static service except some which were taken as periphery by the new kebele organization. Only in four health centers additional outreach service is given currently which are taken as periphery. In the former time almost all health centers were giving out reach service but it stopped now as they said.

The reason they stated is most of the health centers in Addis Ababa are taken as in the center and it is believed that they are accessible to the community in all aspect and the other is the number of clients coming to the outreach service is small and the responsible body was calculated this and it was said that the expense and the beneficiaries were not balanced.

"Previously out reach service was present but currently it is stopped because this health center is accessible to the communities in all aspect including transport".

"*Only small number of clients were coming to the outreach site when we were giving the outreach service especially in children about 5-6 maximum 10 so that the service is stopped now"*.

Currently as it was also mentioned, in the health centers which have outreach service only small number of children are coming to the out reach service and getting the vaccines. *'In one out reach site in one session some said may be 8-10 and the others said around 15-20 children are coming it depends on the catchments area for immunization"*. In case of the women as they said it is the same in some sites more and some sites less. It was also mentioned that the outreach service is organized by the kebele health representatives for which they do social mobilization and awareness creation but most of the respondents said this is not enough and not proper. As one of them said "*from my experience the kebele health representatives were not doing properly the awareness creation and social mobilization I didn't see them when they were working even for one day .*"

Quality of EPI service

Concerning the quality they were stated on different point of view :-

Cold chain: - all said that there is no problem regarding refrigerators and cold boxes but they mentioned the problem of electric power interruption which leads to the interruption of cold chain and the vaccines might be spoiled. If it continues like this, it may create dangerous situation for keeping the cold chain as they fear and it will compromise the quality f service. Other wise they said the temperature is monitored 2 times daily in the

morning and afternoon properly. But there is a long time problem during night time, weekends, and holidays cold chain could not be monitored because the responsibility is given to EPI coordinator and the key is kept to him for different reasons one of the respondents said that" *there was a trial of robbery at the EPI corridor so that the EPI room key is strictly kept with the coordinator and it is not allowed to give the key for other person"*. The problem to assign the coordinator during duty time, holiday, and weekends because there was no payment for those who will be assigned during duty times, but now it is planned to give the responsibility to the duty staff or the emergency on call staff as they said. Concerning the electric power problem all of them recommended that generator should be available not only for EPI but also for other services one respondent said" *in the delivery there is a big task some times there might be about 9-10 deliveries* with *in one night previously we had chargeable ampoule we were using that during the power interruption but now it is broken and we are facing a big problem"*.

Vaccines supply and its quality:- all of them said that there is no problem on vaccine supply there is continuous supply from the regional health bureau except once there was problem of getting pentavalent for about 2-3 days on one health center because the new staff in the regional health bureau was assigned and they were on take over. It was also mentioned that in all health centers there is registration book for the vaccines which they took. It contains information about he vaccine VVM, expiry date and batch number by this the vaccine status is recorded and monitored in the health center.

As they said the VVM of pentavalent is mostly stage 2 when they took from the regional health bureau and it was reported repeatedly but the responsible body in the sub-city and

regional health bureau said no problem you can use it. One of the respondents said that there might be some rare conditions which compromise the quality of vaccine we are giving like for example" *there are some polio vials here in this health center which change their color to reddish but the VVM is not changed and the expiry date is not yet reached"*. It was reported to the sub city and it was also raised on meeting but no body was decided on that and it is kept separately in the refrigerator.

Concerning the infection prevention all of the respondents said that they are using AD syringe and one syringe is only for one client *"if you draw the syringe once by mistake , you can not retry it again by the same syringe so that we are using one syringe for one individual"*.

For the disposal of the used sharp things including needles they were using sharp resistance safety box. According to the respondents the used needles were not re-cupped while disposing in the safety box when it reached at the level of 75% it will be sent to the incinerator to burn it. For other dry cottons and swabs they were using separate baskets.

One of the respondents said that regarding this *"most of the staffs of health center took training on this topic and in this health center committee is formed by taking one representative from different departments including the cleaners they visit all the compound periodically and if they see some thing they try to teach and make the surroundings clean and attractive on the spot"*.

***Injection abscess**: - most of them said "since we are using disposable syringe and needle at present time it is not seen especially in children previously when we were using boiled reusable needle we saw some*". It was also mentioned that in some places it is not allowed for the free service nurses or students unless they have experience to give

injection for the children *"I don't want to do some thing to some one what I don't want to done on me or my children"*. On TT immunization for the mothers there are some women coming with redness of the injection site which related to the drug it self we reassure and apply cold compress by ice then it will be disappeared. The other respondent also mentioned even after using the AD syringe it was seen rarely it was tried to find out the reason and it is believed that the use of water for swab during injection because it is not sterile when one try to pick it for each injection it might be contaminated. *"After we stop to use water swab no abscess is seen"*.

Regarding the staffs: - it was mentioned that at least one trained staff on EPI is assigned. Previously the staffs were working on rotation base every 6 months but recently in almost all health centers it was started to assign at least the EPI coordinator permanently for long period of time for the sake of quality service by well experienced and trained staffs. The other thing which was mentioned was about there is no permanent periodic training on EPI or continuous refreshment which is important for the quality service. It was also mentioned that the quality of service is compromised by the rooming condition of the EPI unit. EPI unit needs good ventilated area but if you see ours it is not well ventilated and not convenient. There was a saying from one of the respondents "*When you see our health center, I can say the service delivery in our heath center does not fulfill the* standard *the room is single and it is over crowded by different old materials so that it should be improved"*.

Routine EPI coverage

All said generally in children it is good the problem lies on TT immunization. They said that when you want to see the actual number of clients who are coming to the EPI

service it is high but in the case of percentage it become low and this mainly due to the denominator. And they said we are using the previous census which is exaggerated. Some of them said that now it the 4th quarter but the coverage for the year is still low even it is not reached 50%.one of the respondent said that because of this there was a trial to get exact number of the target by house to house survey and it showed very less number of children in the target area which was given for this health center so that it is due to problem of denominator.

Two of them said that for example the target given for one sub city by the previous census was 400,000 some thing but by the new census it become 200,000some thing ; and the other said previously the target population for this health center was 146,000 but with the new census it become 108,000. For the question about Addis Ababa coverage most of them said that in addition to the denominator problem there is also problem of reporting system starting from the health center up to the higher level attention was not given for reporting system. One of the respondent said every body on each level should check strictly about the accuracy of the data which was sent to him/her "*After I assigned here no report is sent before I approved it"*.

Missed opportunity

It was mentioned that all who are coming to the health center are addressed especially in children and missed opportunity is not a problem in the heath center. In the case of mothers especially for non pregnant ones it was not done much even in the health facility and the coverage for TT immunization is very low as they said. However some of them said there may be missed ones but it is rare especially in children. The magnitude of missing in the health facility is very small as it was mentioned. Some of the respondents

were mentioned there might be missing in those who could not come to the health center and if they show up in the health center, they will get the vaccination. During the interview for the question about the reason why they might be missed they said that they don't have awareness on EPI and its use on one side and there may not have health facility near by to them on the other hand .But most of them stressed on the lack of awareness on EPI. For the solution it was also mentioned that the service should be go down to the kebele or to village in the periphery areas.

Only one of the respondents said though missed opportunity is rare in the health facility it was not done properly. Some times here in the health center you might get those who were born in the health center but didn't get the vaccine. So that especially in Addis Ababa one miss is also not acceptable. The other thing which was mentioned is during holidays and weekends if the mother gave birth in the health center they might be discharged with out getting the vaccine some might send or brought the child and get the vaccine and some might not. until now there was no strong tracing mechanism so that there might be missed. Recently it was started to record the telephone number of the clients so that it will be possible to trace them.

6.DISCUSSION

A few studies have been done in some countries which were community based and in under two years of age children and one study done (20 years back) here in Addis which was health facility based and in under two years of age children showing high magnitude of missed opportunities. Though these studies are not recent they showed that opportunities to immunize children were often missed when the children were shown up in the health facilities for reasons other than immunization. One study done in Sudan showed, of the 236 infants who were brought to the health facilities for reasons other than immunization 58% were in need of at least one antigen and 33% in need of 3 or more antigens, additionally 29% of infants were not vaccinated before. The study done in Ethiopia in 1989 also showed magnitude of missed opportunities was 41% in children who were come to the health facilities for reasons other than immunization (6,13,17,19,20).

This study was conduced in less than one year age children and accompanying women who came to public health centers for medical services other than immunization. The selected health centers had similar activities on service delivery.

The study shows that magnitude of missed opportunity for routine immunization in children is low (7.5%). As shown in some studies done in other areas previously the immunization service was not integrated and the magnitude of missed opportunities for routine immunization was high. But currently as shown by this study the immunization service in Addis Ababa is integrated and it was observed in the health centers every child came to the IMNCI unit was screened for his/her immunization status and if the child was eligible /not immunized he/she was linked to the EPI unit to give the respective vaccines

for the child's age. This might be one of the reason for the decreasing of missed opportunity in Addis Ababa.

The accessibility of the service in Addis Ababa shows some improvement as it was mentioned by in-depth interview and this also shows that those who could come to the health center will get the service. The other factor for the low proportion might be the study was done in health facility on whom could able to come to health center by one or the other reason since the service was integrated the probability of getting vaccination will be high.

In this study factors associated strongly with missed opportunities for routine immunization in children were place of birth for which no evidence was seen by other studies that is those who were borne at home had more chance to be missed than those borne in the health facility and the other was children who have 2 or more siblings were more likely to have missed opportunities than those didn't have. Maternal/care taker education has also significant association. Monthly house hold income and maternal/care taker marital status were found to confounding gactors.

Of the missed ones only 34(54%) were able to mention the reason of not immunizing the child. The reasons given by most of them 16(100%) were lack of motivation (postponed the appointment date, immunization card lost, home delivery, don't want to have vaccination, mother busy, inconvenience of the mother and forgetting about the immunization & immunization date), lack of information (includes unaware of need for immunization, unaware of the need to return for subsequent doses of vaccines, don't know the advantage of immunization and wrong information about immunization

schedule) and obstacle(includes mother sick, mother was separated from her child, went to rural area and vaccine was not present).

This study also showed the magnitude of missed opportunities for mothers of child bearing age .Of the 817 eligible women 249(30.5%) were missed the opportunities. As compared to the children the magnitude of TT missed opportunity for mothers was high. In those old studies the magnitude of TT missed opportunity was high as compared to children. AS it was mentioned by in-depth interview less attention was given for the maternal TT immunization. It was also shown most of the women were reached when they get pregnant and came in to the health facilities for ANC service. For the non pregnant especially for those who didn't have history of pregnancy previously nothing was done. Recently to reach the non pregnant ones campaign was started in high schools and in some of factories since only 2 TT dose was given in the schools, there was a fear by health professionals for the completeness of the TT immunization. Because the awareness of the clients about TT immunization and its advantage was low.

Factors associated with this TT missed opportunity were also shown in the study the most important factor which has significant association was occupational status those who were not governmental or non governmental employee had 3 to 6 times more chance to have missed the opportunity. Marital status had also association those who were never married were 3 times more chance to have missed the opportunity as compared to the married ones. The chance of being pregnant for the never married women is less so that they will not go to the health facilities for ANC and they will be missed and this might reflect that the absence of more attention for the non pregnant women.

On the contrary no or low attention was given for those who could not come to the health facilities and this study shows also no body know about those who could not come to the health facilities. Most of the out reach services were closed and there was no strong mechanism for tracing of defaulters and missing in the community. The study also showed that the attendants in the existing outreach service were not much which needs strong and proper health education, awareness creation and social mobilization works and it might be better to involve the health professionals for this activity.

The other findings in this study were the absence of standard guideline or policy for contraindication of immunization in the health centers which might affect the immunization coverage by taking wrong assumptions about the contraindication of immunization. Though it is stated in the EPI policy guide line which was revised in 2007 (4), all the health centers included in the study didn't know it and it was not available in the health centers. It was also found that there was no successive training or refreshment course on EPI which may compromise the service quality. In most of the health centers the rooms for the EPI unit is narrow and over crowded. As it was seen in this study the EPI service is integrated with other services like under five clinics, nutritional rehabilitation and growth monitoring clinics in the health centers.

Most of the clients didn't mention the name of the vaccine and target diseases only 37(4.4%) could mention the name of three and above names. And about the disease names 55.6% were not able to mention any of the target diseases ,18.3% mentioned only one name,17.6% were able to mention two names ,7.3% mentioned three names and only 1.1% able to mention four names.

Limitation of the study

- Absence of recent studies on this topic for comparison.
- Since it is done in the health facilities the conditions in the communities might be undermined.
- The study was cross sectional.
- There might be recall bias.
- Social desirability bias.

Strength of the study

- Since there was no recent study on this topic, this study will give current information on missed opportunity in the health facility.
- Give also a clue to find the gaps on immunization coverage.
- The study was conducted in the health centers from each 10 sub cities in the town which can make generalizability possible for the activities in the health facilities.

7. Conclusion

The magnitude of missed opportunity for both mothers and children were low presumably because the utilization of the health service by the clients seems good and the effort of health professionals using the opportunities for children's immunization is also good though it not sufficient for women TT immunization. The integration service in the health centers have shown a positive effect on the decreasing magnitude of missed opportunities. The service is given mainly for those who could come to the health centers. For those who could not come to the health facilities nothing was done as the study showed most of the previous out reach services were closed this might affect the immunization status of those who could not come to the health facilities and those who

are living in the periphery areas. The awareness creation activities were not enough. Tracing mechanisms for the defaulters was not well organized and there was no uniform understanding about the contraindication for immunization which may compromise the EPI service by false contraindication. Attention was not given for the non pregnant women since the campaign was started in the schools and some factories. However some health centers started late for which the schools will be closed in the near future for summer break.

8. Recommendations

FMOH, the city health authorities and other responsible bodies need to expand access to EPI services in order to increase routine immunization coverage by involving private clinics and providing out reach services in the selected high population concentration and hard to reach areas. Activities to increase maternal motivation, awareness creation and social mobilization should be done. Standard contraindication for immunization guide lines should be available in order to avoid false contraindication which will compromise immunization service. Further study is recommended regarding this topic to see the status in the community.

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10 ANNEX

10.1 INFORMED CONSENT FORM

ASSESMENT OF CAUSES OF MISSED OPPORTUNITY FOR ROUTINE IMMUNIZATION IN ADDIA ABABA, ETHIOPIA

GREETINGS

My Name is----------.I came from Joint Addis continental public health institute and university of Gondar.I am data collector. We are conducting the study of assessment of causes of missed opportunities for routine immunization on 0-1 year old children visiting selected public health centers in Addis Ababa for routine services such as curative services, nutritional rehabilitation, and growth monitoring. The reports and studies have shown the immunization coverage of Addis Ababa is still did not reach the expected level. The main objective of this study is to get relevant information about the causes of this low coverage and to recommend the possibilities of improving immunization coverage. We planned to ask clients who are coming to this health facility in under five clinic department during one month period. You are approached simply because you came at the time when we planned to do the study.

If you are willing to participate in the assessment we will ask you questions that are commonly referred to the points stated above. The questions will focus on issues related to your child immunization status, knowledge, & perception, attitude about immunization and it's influencing factors. But in this study we will record your response in separate form that will be accessed by the team doing the assessment we will conduct the interview in quite and private place. The form will not register personal identification and your response will be kept strictly confidential.

Participation into the assessment scheme is only by consent. you are free to decide whether you want to participate or not in the assessment .either decision will not affect your right and privilege to get the regular services .you are also free to discontinue the interview any time if you want to do so.Are you willing to participate in the assessment?

If Yes, ----------

Informant Signature----------

Interviewer Name----------

Interviewer Signature ----------

Date-------day--------month ----------year

Continue the interview

If No, ---------- Thank the client and end her

10.2 QUESTIONNIARS FORM FOR ASSESSMENT OF CAUSES OF MISSED OPPORTUNITIES FOR ROUTINE IMMUNIZATION IN ADDIS ABABA

Please write the response

Name of the principal investigator ----------

Serial number----------

Date of interview --------/-------/---------

Name of the health facility----------

The Job description of the respondent----------

Part I—information about the conditions of health facility

General Information Related to health facility status		
Ser. No	**Questions**	**Al ch res**
101	**Type of the clinic** Sick baby clinic------ Nutritional rehabilitation------ Growth monitoring---------- Other (specify)----------	Ye --- No --- Ye --- No --- Ye --- No --- --- ---
102	Are the vaccine supplies available? BCG---------- DPT-HepB-Hib-------- M EASLES Vaccine---------- TT vaccine for women----------	ye --- No --- Ye --- No ---

		Ye --- No --- Ye --- No ---
103	Is the cold chain supply available?	Ye --- No ---
104	Are staffs trained in immunization and cold chain available ?	Al sta --- So sta -2 N the ---
105	When did the training given?	< mo --- 3-6 --- 2 6 r --- 3 6-1 mo --- > mo --- Do kn ---
106	Do the health center's health workers routinely record the Immunization status of the client?	Al --- So tim --- Ne ---

107	Is there a guide line for contraindication? At national level----- Specific to the health facility----	Ye --- No --- Ye --- No ---
108	What are the contraindications that you didn't give the vaccine?	En ful ser the res

The following questions will be filled by data collectors

Name of the health facility----------

Name of the interviewer----------

Date of the interview(dd/mm/yy)----------

Serial number----------

Part I socio demographic characteristics

201	Relation of the accompanying person	Mother----------1 Father----------2 Other,specify----------77	
202	What is Sex of the child?	Male---------- -------1 Female---------- 2	
203	What is the Age of the child?	Months---------- Weeks---------- Days----------	
204	Where was the child born?	Health facility----------1 Home ---------- -2	
205	Mother/caretaker How old are you?	Write in years---------	
206	Marital status of the mother /care taker	Married---------- 1 Never married----------2 Divorced---------- 3 Separated----------4 Widowed----------5 Other (specify)---------- 77	
207	Educational status of the mother or care taker.	Illiterate----------1 Read & write---------- --2 Elementary(1-8)----------3 Secondary(9-12)----------4 Highereducation(>12)----5 Other(specify)----------77	
208	Mother/care taker,What is your occupation?	Government-employee---1 NGOEmployee----------2 Self employee----------3 Dailylaborer----------4 House wife----------5 Other(specify)----------77	
209	Mother, How much is your monthly income?	<500br.----------1 501-1000br.---------- 2 >1000br.---------- 3	

		Don't know----------88	
210	Mother, what is your religion?	Christian----------1 Muslim----------2 Other (specify)---------- 77	
211	Do you have other children?	Yes----------1 No----------2	
212	How many children do you have?	Enter the number(If No skip to Q 314)	
213	Are they immunized?	All are vaccinated----------1 Some are vaccinated-------2 No one was vaccinated----3	
Part II Immunization status of the child			
314	Does the child have immunization card?	Yes---------- 1 No---------- 2	
315	Have you brought the immunization card with you in the clinic today?	Yes----------1 No----------2(If NO skip to Q 318)	
316	If "yes", Can I see it please?	Yes----------1 No----------2	

317 Copy the vaccination date from the immunization card,write"55"if there is incorrect recording.

Vaccines	**Date vaccination taken DD/MM/YY**	**Tick"X" if there is missed vaccine**
BCG	----/----/---	----------
OPV0	----/----/---	----------
OPVI	----/----/---	----------
DPT-HepB-Hib1	----/----/---	----------
OPV2	----/----/---	---------
DPT-HepB-Hib2	----/----/---	---------
OPV3	----/----/---	---------
DPT-HepB-Hib3	----/----/---	---------
MEASLES	----/----/---	----------

318 child's immunization status by history, tick "x" on the given blank space

Vaccines	**vaccinated**	**Missed vaccine**	**Don't Know**
BCG	----------	----------	----------
OPV0	----------	----------	----------
OPVI	----------	----------	----------
DPT-HepB-Hib1	----------	----------	----------
OPV2	----------	----------	----------
DPT-HepB-Hib2	----------	----------	----------
OPV3	----------	----------	----------
DPT-HepB-Hib3	----------	----------	----------

MEASLES ---------- ---------- ----------			
319	What were the reasons that the child being not immunized?	Enter the full sentence of the response	
320	Why do you bring the child to the health center today?	Baby sick----------1 Nutritional rehabilitation---2 Growth monitoring----------3	
321	Was immunization offered today during visit in the clinic?	Yes----------1 No----------2	
322	If immunizations were offered to the child today during visit, were you willing to take the vaccine?	Yes----------1 No----------2	
323	Immunization status of the child	1.Not immunized 2.PartiallyUptodatvaccinated 3.partially not up to date vaccinated 4.Defualter 5.Fully vaccinated	
324	Mother/care taker can you mention the routine vaccines by name?	Write the full sentence of the response	
325	Mother, can you mention the EPI target diseases?	Write the full sentence of the response	
Part III Questionnaire about the immunization status of the accompanied women			
426	Is the mother/care taker eligible?	Eligible ----------1 Not eligible----------2	
427	Do you have immunization card for your self?	Yes----------1 No----------2	
428	If "yes" have you brought the card today?	Yes----------1 No----------2(If No, skip to Q 430)	

429 Immunization status of the accompanying woman

Vaccine given	Copy immunization date from the card and write"55" if incorrect recording DD/MM/YY	Tick"x"if missed dose
Tetanus Toxoid 1	---/----/----	---------
Tetanus Toxoid 2	-----/----/----	---------
Tetanus Toxoid 3	----/----/----	---------
Tetanus Toxoid 4	----/----/----	---------
Tetanus Toxoid 5	----/----/----	----------

430. women immunization status by history Tick "x"in the given space

Immunization given by history	Vaccinated	Missed	Don't know
Tetanus Toxoid I	----------	----------	----------
Tetanus Toxoid II	---------	----------	----------
Tetanus Toxoid III	---------	----------	----------

Tetanus Toxoid IV Tetanus Toxoid V	--------- ----------	---------- ----------	---------- ----------
431	What are the reasons for missing the vaccine?	Inter the response in words	
432	Were you offered to take TT vaccination?	Yes----------1 No----------2	
433	Would you have accepted immunization today, if it had been offered?	Yes----------1 No----------2	
434	Would you please tell me about the advantage of immunization?	It is useful----------1 Other(specify)----------77	
435	Do you have any thing to add about immunization?	Enter the full word of the response	

THANK YOU

10.3 TOPIC GUIDES FOR QUALITATIVE IN- DEPTH IN TERVIEW

1. How is the general routine EPI service in Addis Ababa?
2. How is the current routine EPI service organized?
3. How do you see the current EPI service quality?
4. What do you think about the coverage of routine EPI service?
5. What do know about missed opportunity for routine EPI?

10.4 ቃለ መጠይቅ ስለ ማድረግ የስምምነት ፎርም

እኔ _____ እባላለሁ ከአዲስ ኮንትኔንታል የህብረተሰብ ጤና አጠባበቅ ተቋም ነው የመጣሁት እኛም ወደ ጤና አገልግሎት የመጡ ህዓናት ሊያገኙት የሚገባ ግን ሳገኙት የቀረ የክትባት አገልግሎት ምን ያህል እንደሆነና ምክንያቱም ምን እንደሆነ ልናጠና ነው ። አንዳንድ ጥናቶችና ሪፖርቶች እንደ ሚያመለክቱት በአድስ አበባ የክትባት ሽፋን የተጠበቀውን ያህል አልደረሰም ። የጥናቱም ዋና አላማ ለዚህ ዝቅተኛ ውጤት መንስኤ የሆኖቱን ጠቃሚ መረጃዎች ሰብስቦ የሚሻሻልበትን መንገዶች መጠቆም ነው። ለዚህ የሚጠቅም የጤና አገልግሎት ተጠቃሚዎችን ቃለ መጠይቅ ማድረግ ነው። እርሶን አሁን የምናነጋግሮት እኛ ጥናቱን በምናደርግበት ጊዜ እዚህ በመገኘቶዎ ነው እንጂ ሌላ ምንም ምክንያት የለውም ።

እርሶ ፍቃደት ከሆነ ቃለ መጠይቁን እናደርጋለን ነገር ግን ፍቃደት ካልሆነ አለመሳተፍ ይችላሉ። ባለመሳተፍአ ምንም በርሶ ላይ የምያመጣ ተጽኖ የለም ጥያቄዎቹ የሚያተኩሩት የዘውት የመጡትን ህዓን የክትባት ሁኔታ በተመለከተ ስለ ክትባት ያለዎትን ግንዛቤ እና አስተያየት በተመለከተ ነው። በምናደርገው ውይይት ላይ የርሶ ስም አይጠቀስም የሚሰጡትም መረጃ ምስጥራውነት እስከመጨረሻው የተጠበቀ ይሆናል።

ፈቃደኛ ኖት ?

1 አዎን ፍቃደኛ ነኝ

2. አይ ፍቃደኛ አይደለሁም

ቃለ መጠይቁን የሚያደርገው ሰው ስም_____

ፊርማ_____ቀን---/---/--

10.5 “Missed opportunity for routine EPI” ጥናት አጠቃላይ መረጃ መሰብሰቢያ ቅፅ::

የጤና ጣቢያን ሁኔ በተመለከተ መጠይቅ

ጥናቱን የሚያጠነው ሰው ስም _____

ተራ ቁጥር _____

ቀን_____/_____/_____

የጤና ተቋም ስም_____

መረጀውን የሰጠው ሰው

ሀ. የህክምና ሐላፊ _____

ለ. የክትባት ክፍል ሐላፊ _____

ሐ. ሌላ _____

101.	የጤና ጣቢያ የክትባት አገልግሎት ይሰጣል?	1. ይሰጣል ☐		መለያ
		2. አይሰጥም☐		
102	. በጤና ጣቢያው የክትባት አቅርቦት አለ?			
	ቢ.ሲ.ጂ	1 አለ	2. የለም	
	ፖሊያ	1 አለ	2. የለም	
	ዲፒቲ	1 አለ	2. የለም	
	ኩፍኝ	1 አለ	2. የለም	
	ቲቲ (ለሴቶች)	1 አለ	2. የለም	
103	የጤና ጣቢያዎቹ ስለ ክትባት ስልጠና ወስደው ያውቃሉ?	1 ሁሉም ወስደዋል 2 አንዳንዶቹ ወስደዋል 3.ማናቸውም አለወሰዱም(ወደ ጥያቄ 105)		

104	**መቼ ነው ስልጠናውን የወሰዱት?**	**1 ከሶስት ወር በፊት** **2.ስድስት ወረ ሆኖታል** **3. አንድ አመት ይሆነዋል** **4. ከአንድ አመት በላይ ሆኖታል** **88. አለውቀውም**	
105	**በጤና ጣቢያው ውስጥ** "cold chain"	**1. አለ** **2. የለም**	
106	**የጤና ጣቢያው ባሙያዎች ክትባት ከሰጡ በኋላ በየጊዜው ክትባቱ ካርዱ ላይ ይመዘገባል?**	**1ሁልጊዜ** **2. አንድ አንድ ጊዜ** **3.ምንም አይመዘግቡም**	
107	**ክትባት ስለማይሰጥባቸው ሁኔ ዎች የወጣ መመሪያ አለ?**		
	በአገር አቀፍ	**1. አለ**	
		2. የለም	
	ለጤና ጣቢያው የተለየ	**1. አለ**	
		2. የለም	
108	**ክትባ የማይሰጥባቸው ሁኔ ዎች ምን ንደሆኑ ሊነግሩይ ይችላላ?**	1._____ 2._____ 3. _____ 4._____ 5. _____ 6. _____	

"Missed opportunity for routine EPI in Addis Ababa" **ጥናት አጠቃላይ መረጃ መሰብሰቢያ ቅፅ፡**

የጤና ተቋም ስም_____
መረጀውን የሚሰበስበው ሰው ስም_____
መረጃው የተካሄደበት ቀን _____/____/_____

ተራቁጥር_____
ክፍል አንድ፡ የህፃኑንና ህፃኑን ይዘው የመጡትን ሴት በተመለከት ፡(መልሱን የሚያመለክተውን ቁጥር ያክብቡ)

201	**ህፃኑን ይዘው የመጡት ሰው ከህፃኑ ጋር ያላቸው ገ**	1 እናት 2. አባት 77 ሌላ ካለ ይግለጹ
202	**የህፃኑ ጸታ**	1. ወንድ 2. ሴት
203	**እድሜ**	_____ወር

		_____ሳምንት _____ቀን
204	የተወለደበት ቦታ	1. ጤና ተቋም 2. እቤት

ከዚህ በታች የተዘረዘሩት ጥያቄዎች ህፃኑን ይዘው የመጡትን ሴት በተመለከተ

205	እድሜ	_____ዓመት 88 አላውቀውም
206	የጋብቻ ሁኔታ	1.ያገቡ 2. ያላገቡ 3. የተለያዩ 4. የሞተበት 77. ሌላ ካለ ይግለጹ
207	የትምህርት ደረጃ	1.ምንም ያልተማረ 2. ማንበብና መጻፍ 3. አንደኛ ደረጃ (1-8) 4. ሁለተኛ ደረጃ (9-12) 5. ከፍተኛ ትምህርት (>12) 77. ሌላ ካለ ይግለጹ 1.
208	ሥራ	1.መንግስት 2. መንግሥታዊ ያልሆነ ድርጅት 3. የግል ድርጅት 4. የቤት እመቤት 5. የቀን ሠራተኛ 77. ሌላ ካለ ይግለጹ
209	የቤተሰቦሞ የወር ገቢ ምን ያህል ይሆናል?	1.<500 2. 501 - 1000 3. >1000 88. አላውቀውም 77. ሌላ ካለ ይግለጹ
210	ሀይማኖት	1. ክርስትና 2. እስልምና 77.ሌላ ካለ ይግለጹ
211	ሌላ ልጆች አሉዎት?	1. አለ 2. የለም
212	ስንት ልጆች አሎት?	መልሱን በቁጥር ይሙሉ
213	ልጆቹ ክትባት ወስደዋል?	1.ሁሉም ተከትበዋል

		2. ንዳንዶቹ ተከትበዋል 3.ማናቸውም አልተከተቡም
ክፍል ሁለት፡ ይዘውት የመጡትን ህዓን የክትባት ሁኔታ በተመለከተ፡		
314	ህዓኑ የክትባት ካርድ አለው?	1. አለው 2. የለውም
315	የክትባት ካርዱን ዛሬ የዘውት መጥተዋል?	1. አምጥቼዋለሁ 2.አላማጣሁም(ወደ ጥያቄ ቁጥር318)
316	ማየት ይቻላል?	1. ይቻላል 2. አይቻልም

የህዓኑ የክትባት ሁኔታ የክትባት ካርዱ ላይ በተመዘገበው መሠረት

317	ከክትባቱ ካርድ ላይ እያንዳንዱን ክትባት የወሰደበትን ቀን በተሰጠው ክፍት ቦታ ይሙሉ፡፡ሳይከተብ የቀረውን ክትባት ደግሞ በተሰጠው ክፍት ቦታ ላይ (x) ምልክት ያድርጉ ህዓኑ ክትባት ወስዶ ቀኑን ካርዱ ላይ ካልተሞላ በመጠይቁ የቀን መጻፊያ ቦታ« 55 » ይሙሉ፡፡	
	የክትባቱ አይነት / ክትባቱ የተሰጠበት ቀን /ወር/ ዓ.ም ቢሲጂ ---/---/--- ፖሊዮ-0 ---/---/--- ዲፒቲ-1 Hepb+Hib ---/---/--- ፖሊዮ-1 ---/---/--- ዲፒቲ-2 Hepb+Hib ---/---/--- ፖሊዮ-2 ---/---/--- ዲፒቲ-3 Hepb+Hib ---/---/--- ፖሊዮ-3 ---/---/--- ኩፍኝ ---/---/---	ሳይከተብ የቀረው የክትባትአይነት «X» ------ ------ ------ ------ ------ ------ ------ ------ ------ (ወደ ጥ.ቁ 319)

318 የህዓኑ ክትባት ሁኔታ እንደ እናትየው / ተንከባካቢ / አገላለጽ መልሱን በተሰጠው ክፍት ቦታ ላይ (x) ምልክት ያስቀምጡ፡፡

የክትባት አይነት	ተከትበዋል	አልተከተበም	አላውቅም
ቢሲጂ	------	------	------
ፖሊዮ-0	------	------	------
ዲፒቲ-1 Hepb+Hib	------	------	------
ፖሊዮ-1	------	------	------
ዲፒቲ-2 Hepb+Hib	------	------	------
ፖሊዮ-2	------	------	------

ዲፒቲ-3			
Hepb+Hib	------	------	------
ፖሊዮ-3	------	------	------
ኩፍኝ	------	------	------
		(ወደ ጥ.ቁ 319)	

319	ህፃኑ ክትባቱን ያልወሰደበትን ምክንያት	1---------- 2---------- 3---------- 4---------- 5----------	
320	ህፃኑን ዛሬ ወደ ጤና ጣቢያ ለምን ይዘውት መጡ?	1. ስለታመመ 2. ለምግብ 3. ለክትትል	
321	ዛሬ ህፃኑን ክትባት መከተብ እንዳለበት ተነግሮታል?	1. ተነግሮኛል 2. አልተነገረኝም	
322	ዛሬ ህፃኑን ክትባት መከተብ እንዳለበት ቢነገሮት ማስከተብ ፍቃደኛ ነበሩ?	1. ፍቃደኛ ነኝ 2. ፍቃደኛ አይደለሁም	
323	የህፃኑ ክትባት ሁኔታ(ደረጃ)	1. ምንም አልተከተበም 2. እስካአሁን ድረስ ያለውን ሁሉንም ተከትቦአል 3. እስካአሁን ድረስ ያለውን ግማሹን ወስዶ አቋርጧል 4. ጀምሮ ትቷል 5. ሁሉንም ጨርሶ ተከትቧል	
324	እናት /ተንከባካቢው ለህፃናት የሚሰጡትን ክትባት አይነቶች ሊጠቅሱልኝ ይችላሉ?	1---------- 2---------- 3---------- 4---------- 5---------- 88_አላውቀውም	
325	እናት/ተንከባካቢ የህፃናት ክትባት የሚሰጥባቸውን በሽታዎች ሊጠቅሱልን ይችላሉ	1-------- 2-------- 3--------	

	?	4-------- 5-------- 6-------- 7-------- 8-------- 88_አላውቀውም	
ክፍል 3፡ ህጓኑን ይዘው የመጡትን ሴት የክትባተ ሁኔታ በተመለከተ የሚሞላ ቅጽ፡			
426	እናትየው /ተንከባካቢው የቲቲ ክትባት በሚሰጥባቸው የዕድሜ ክልል ውስጥ ነው ያሉት?	1. ናቸው 2. አይደሉም	
427	እናት ለእርሶ የክትባት ካርድ አልዎት?	1. አለ 2. የለም	
428	አሁን እዚህ ይዘውታል?	1. አለ 2. የለም (ወደ ጥ.ቁ 430)	

429 ከክትባቱ ካርድ ላይ ክትባቱን በተሰጠው ክፍት ቦታ ላይ ይሙሉ ።ክትባቱ ተሰጥቶ ቀኑ ካልተጻፈ በመጠይቅ ቀን መጻፊያ ላይ « 55 » ይሙሉ። ያልተሰጠውን ክትባት ደግሞ በተሰጠው ክፍት ቦታ ላይ (x) ምልክት ይሙሉ።

የክትባት አይነት	ክትባቱ የተሰጠበት ቀን/ወር/ዓ.ም	ያልተሰጠው ክትባት
ቲቲ1	----/----/----	--------
ቲቲ2	----/----/----	--------
ቲቲ3	----/----/----	--------
ቲቲ4	----/----/----	--------
ቲቲ5	----/----/----	--------

430 የገለሰቧ የቲቲ ክትባት ሁኔታ እንደርሳቸው አገላለጽ መልሱን በተሰጠው ክፍት ቦታ ላይ (x) ያስቀምጡ፡

የክትባት አይነት	ተከትቤያለሁ	አልተከተብኩም	አላውቀውም
ቲቲ1	--------	--------	--------
ቲቲ2	--------	--------	--------
ቲቲ3	--------	--------	--------
ቲቲ4	--------	--------	--------
ቲቲ5	--------	--------	--------

(ወደ ጥ.ቁ 430)

431	ክትባቱን ያልወሰዱበትን ምክንያት	1---------- 2---------- 3---------- 4----------	

		5----------	
432	ክትባቱን አሁን ይወሰዱ ተብለው ተነግሮት ነበር?	1.ተነግሮኛል (ወደ ጥ.ቁ 433) 2. አልተነገረኝም (ወደ ጥ.ቁ 432)	
433	ክትባቱን አሁን ወሰዱ ቢባሉ ለመውሰድ ፍቃደኛ ነበሩ?	1. ፍቃደኛ ነኝ 2. ፍቃደኛ አይደለሁም	
434	ክትባት በሽታን በመከላከል ረገድ ያለውን ጠቀሜታ በተመለከተ ምን አይነት ግንዛቤ አሎት?	1. ጠቃሚ ነው 77. ሌላ ካላ ይግለጹ	
435	ሌላ ተጨማሪ ነገር ስለክትባተ መናገር የሚፈልጉት ካለ?		

አመሰግናለሁ !!!

1. በጤና ጣቢያው ወይም በአካባቢው ስላለው አጠቃለይ የእናቶችና የህጻናት የክትባት አገልግሎት ቢነግሩኝ ?
2. በጤና ጣቢያው የክትባት አገልግሎት አሰጣት አደረጃጀት እንዴት ነው?
3. በጤና ጣቢያው ወይም በአካባቢው የሚሰጠው የክትባት አገልግሎት ጥራት እንዴት ነው? ምን ይመስላል?

4. በአጠቃላይ የ «routine EPI" ሽፋን ምን ይመስላል?

5. **የክትባት አገልግሎት ስለማያገኙ (Missed opportunity) ግለሰቦች ወይም የህብረተሰብ ክፍል ምን ግንዛቤ አለዎት?**

Declaration

I, the undersigned declare that this thesis is my original work in partial fulfillment of the requirement for the degree of Master of Public Health. I also declare that it has never been presented in this or any other university and that all resources and materials used in the thesis have been duly acknowledged.

Student Name: _____

Signature: _____

Place of submission: _____

Date of submission: _____

This thesis has been submitted for examination with my approval as a university advisor.

Advisor Name: _____

Signature: _____

Date of submission: _____